

II. AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for delivering of a plurality of RDMA messages, the method comprising the steps of:

placing each out-of-order RDMA message to a reassembly buffer, wherein each in-order RDMA message bypasses the reassembly buffer and is sent to an internal data buffer for direct placement to a destination buffer;

storing information regarding each out-of-order RDMA message on a per TCP hole basis, wherein a TCP hole is a vacancy created in a TCP stream as a result of an out-of-order TCP segment, wherein the information stored for RDMA Read messages includes at least a number of pending RDMA Read Request messages waiting for a doorbell ring in a connection context on a per TCP hole basis or a number of completed RDMA Read Response messages on a per TCP hole basis; and

delivering the plurality of RDMA messages in-order, such that the out-of-order RDMA messages are reassembled in-order in the reassembly buffer, wherein, for RDMA Send type messages, the delivering includes, for each RDMA Send message of a TCP hold, placing a completion queue element (CQE), the CQE including RDMA Send message specific information, in a work queue element (WQE) associated with the respective RDMA Send message and keeping a number of RDMA Send messages in a connection context on a per TCP hole basis.

2. (Previously presented) The method of claim 1, wherein, for an RDMA Read Request message, the storing step includes:

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ringing the doorbell of a network interface controller (NIC) that each of the number of pending RDMA read response messages have been posted to a respective work queue element (WQE) of a read queue upon closing of a respective TCP hole.

3. (Original) The method of claim 2, further comprising the step of processing each WQE.
4. (Cancelled).
5. (Currently amended) The method of claim [[4]] 1, further comprising the step of placing a completion queue element (CQE) to a completion queue (CQ) upon closing of the TCP hole.
6. (Currently amended) The method of claim [[4]] 1, wherein a number of CQEs is equal to a number of RDMA Send messages of the TCP hole.
7. (Currently amended) The method of claim [[4]] 1, wherein RDMA Send message specific information is retrieved from a respective WQE upon a Poll-for-Completion request by an RDMA verb interface.
8. (Previously presented) The method of claim 1, wherein, for RDMA Read Response type messages, the method further comprises the step of:

reporting completion of RDMA Read work requests upon closing of the TCP hole.

9. (Currently Amended) A system for delivering of a plurality of RDMA messages, the system comprising:

a processor; and

a memory, further comprising:

~~means~~ a system for placing each out-of-order RDMA message to a reassembly buffer, wherein each in-order RDMA message bypasses the reassembly buffer and is sent to an internal data buffer for direct placement to a destination buffer;

~~means~~ a system for storing information regarding each out-of-order RDMA message on a per TCP hole basis, wherein a TCP hole is a vacancy created in a TCP stream as a result of an out-of-order TCP segment, wherein the information stored for RDMA Read messages includes at least a number of pending RDMA Read Request messages waiting for a doorbell ring in a connection context on a per TCP hole basis or a number of completed RDMA Read Response messages on a per TCP hole basis; and

~~means~~ a system for delivering the plurality of RDMA messages in-order, such that the out-of-order RDMA messages are reassembled in-order in the reassembly buffer, wherein, for RDMA Send type messages, the delivering includes, for each RDMA Send message of a TCP hold, placing a completion queue element (CQE), the CQE including RDMA Send message specific information, in a work queue element (WQE) associated with the respective RDMA Send message and keeping a number of RDMA Send messages in a connection context on a per TCP hole basis.

10. (Currently Amended) The system of claim 9, wherein, for an RDMA Read message, the storing means includes:
- ~~means~~ a system for ringing the doorbell of the delivery means that each of the number of pending RDMA Read Response messages have been posted to a respective work queue element (WQE) of a read queue upon closing of a respective TCP hole.
11. (Cancelled).
12. (Currently amended) The system of claim [[11]] 9, further comprising means for placing a completion queue element (CQE) to a completion queue (CQ) upon closing of the TCP hole.
13. (Currently Amended) The system of claim [[11]] 9, wherein a number of CQEs is equal to a number of RDMA Send messages of the TCP hole.
14. (Currently Amended) The system of claim [[11]] 9, wherein the RDMA Send message specific information is retrieved from a respective WQE upon a Poll-for-Completion request by an RDMA verb interface.
15. (Currently Amended) The system of claim 9, further comprising:
- ~~means~~ a system for reporting completion of RDMA Read work requests upon closing of the TCP hole.

16. (Currently Amended) A computer program product comprising a tangible computer useable storage medium having computer readable program code embodied therein for delivering of a plurality of RDMA messages, the program product comprising:

program code configured to place each out-of-order RDMA message to a reassembly buffer, wherein each in-order RDMA message bypasses the reassembly buffer and is sent to an internal data buffer for direct placement to a destination buffer;

program code configured to store information regarding each out-of-order RDMA message on a per TCP hole basis, wherein a TCP hole is a vacancy created in a TCP stream as a result of an out-of-order TCP segment, wherein the information stored for RDMA Read messages includes at least a number of pending RDMA Read Request messages waiting for a doorbell ring in a connection context on a per TCP hole basis or a number of completed RDMA Read Response messages on a per TCP hole basis; and

program code configured to deliver the plurality of RDMA messages in-order, such that the out-of-order RDMA messages are reassembled in-order in the reassembly buffer, wherein, for RDMA Send type messages, the delivering includes, for each RDMA Send message of a TCP hold, placing a completion queue element (CQE), the CQE including RDMA Send message specific information, in a work queue element (WQE) associated with the respective RDMA Send message and keeping a number of RDMA Send messages in a connection context on a per TCP hole basis.

17. (Previously presented) The program product of claim 16, wherein, for an RDMA Read message, the storing program code includes:
- program code configured to ring the doorbell of a network interface controller (NIC) that each of the number of pending RDMA Read Response messages have been posted to a respective work queue element (WQE) of a read queue upon closing of a respective TCP hole.
18. (Cancelled).
19. (Currently amended) The program product of claim ~~[[18]]~~ 16, further comprising program code configured to place a completion queue element (CQE) to a completion queue (CQ) upon closing of the TCP hole.
20. (Currently Amended) The program product of claim ~~[[18]]~~ 16, wherein a number of CQEs is equal to a number of RDMA Send messages of the TCP hole.
21. (Currently Amended) The program product of claim ~~[[18]]~~ 16, wherein the RDMA Send message specific information is retrieved from a respective WQE upon a Poll-for-Completion request by an RDMA verb interface.
22. (Previously presented) The program product of claim 16, further comprising:
- program code configured to report completion of RDMA Read work requests upon closing of the TCP hole.